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GLACIERS
of the ROCKIES & SELKIRKS

SUMMIT OF MT. BALL NEAR VERMILION PASS. FROM SKETCH BY A. P. COLEMAN

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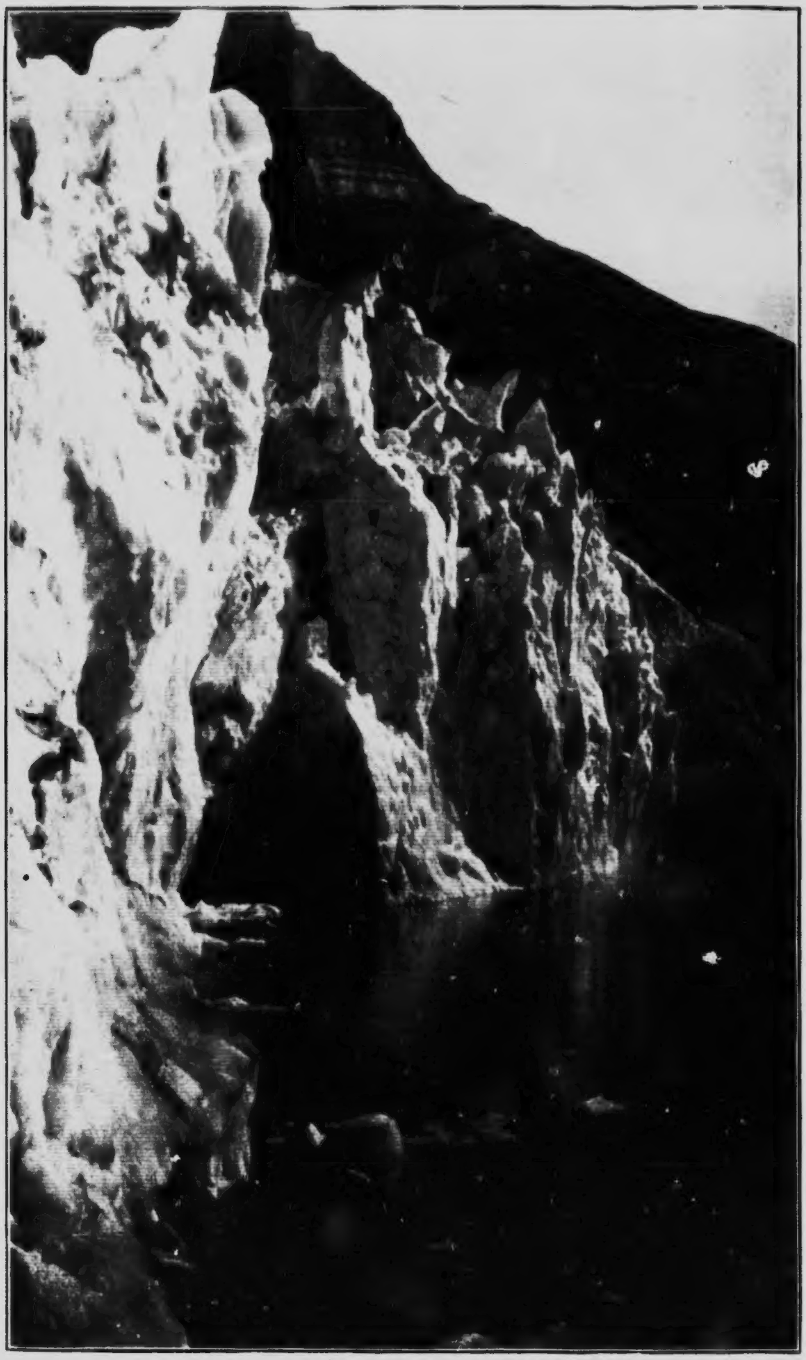

FRONT OF TUMBLING GLACIER ON BERG LAKE

DEPARTMENT OF THE INTERIOR
DOMINION PARKS BRANCH

Glaciers of the Rockies and Selkirks

By

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Published under the direction of
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Glaciers of the Rockies and Selkirks

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THE traveller going westwards from the prairie finds the way blocked by a grim wall of cliffs rising 7,000 or 8,000 feet above the sea and justifying the name of the "Rockies" given to our greatest chain of mountains. Toward the end of the summer these desolate precipices are snowless and except for a glimpse of white peaks through some pass there is scarcely a suggestion of the glacier region within. Then the train enters the "Gap" and before long the summits around show fields or patches of midsummer snow; and as one draws nearer to the heart of the Rockies there is blue ice to be seen clinging to the cliffs or reaching as glaciers down into the wooded valleys, and one is thrilled with the wild charm of alpine scenery.

However, engineers are strict utilitarians and always choose the lowest pass for a railway, so that the passenger in the observation car catches only tantalizing glimpses of the wonders and beauties of the ice world a few miles away and a few thousand feet above the valley. One must stop at some place like lake Louise in the southern Rockies or Tete Jaune in the north or Glacier in the Selkirks to come into real contact with snow fields and glaciers. What a joy it is to get rid of the hot and dusty everyday world of cities for a while and come close to Nature in one of her wildest moods! It is not only the mountaineer who feels the seduction of the cool, clean solitudes where glaciers are born and do their wonderful work. Every healthy man or woman must yield to the delight of living in these inspiring surroundings.

It is worth while to put on warm, strong clothes and hobnailed shoes and fill your lungs with mountain air in a scramble up to the snow fields to see how the glacial machinery works, machinery which some thousands of years ago shaped almost the whole surface of Canada, doing its work on the plains as

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well as the mountains and leaving it the splendid land of lakes and rivers and fertile prairies and rolling hills which it is to-day.

Snowline.

To reach the snows generally means some miles of walking and climbing, often through forest covered slopes at first where the outside world is lost. Then the trees begin to thin and grow stunted, revealing between the trunks blue valleys with a lake or two and far off cliffs and mountains. At last the trees cease at 7,500 feet and you are at timberline. Here the three Rocky mountain heathers spread soft thick carpets between stiff bushes only a few feet high but with trunks a foot through, so buffeted have they been by the storms of centuries. The rows of dwarfed spruces leaning back against some rock ledge give fine shelter for the mountain goats, wisps of whose white wool cling to the stubborn branches.

Then come cliffs and rocky slopes and grassy or sedgy uplands (the true alps as the word is used in Switzerland) where mountain sheep or goats pasture and wild flowers grow by the million, blue ones such as lupines, gentians, fox-gloves and forget-me-nots; yellow ones such as adder-tongues, columbines and a multitude of starry composite flowers; the red or orange Indian paint brush; and white flowers innumerable. You have reached the edge of the snow rapidly melting on a July day under a sun that is hot even on high mountains. The plants just freed from their winter covering are all bursting into bloom together, bees are humming, butterflies lazily flutter past and a humming bird poises over a blossom; for it is spring at these altitudes and there is a whole season's work to be done, seeds ripened and all, before autumn comes in September with its snowstorms burying all under the white silence of a nine-months winter again.

It is a thrilling experience to set foot at last on midsummer snow sweeping upwards gleaming toward the higher summits, snow that never entirely melts and that is so dazzling in the July sunlight that one needs dark or colored glasses to avoid snow blindness if the tramp is to be a long one.

We have no special word in English for these perpetual snow fields and so the French term NEVE is commonly used. Snowline is not nearly so definite as timberline and varies with latitude, exposure and snowfall. In the eastern Rockies of Alberta, where only a few feet fall in winter, the line is scarcely

GLACIER ON PRESIDENT RANGE, YOHO PARK

below 9,000 feet; while in the western Selkirks, which catch the full brunt of the Pacific winds laden with moisture and have a snowfall of 40 or 50 feet in a year, snowline is depressed almost to timberline, about 7,500 feet. This accounts for the bareness of the eastern Rockies as compared with the splendid Alpine features of the Selkirk range, which is the lower of the two.

While one gazes entranced at the array of lakes and valleys, of snowfields and dark cliffs, the wind rises and mountains to the west put on a cap of cloud. This grows and darkens and presently a mantle of mist sweeps up with the wind, the sun is dimmed and in a few minutes the wide world is shut out by a blizzard. We must make our way down to lower levels where sleet whitens the closing flowers, and then through a belt of rain swept hillside into the valley where the sun may still be shining hotly.

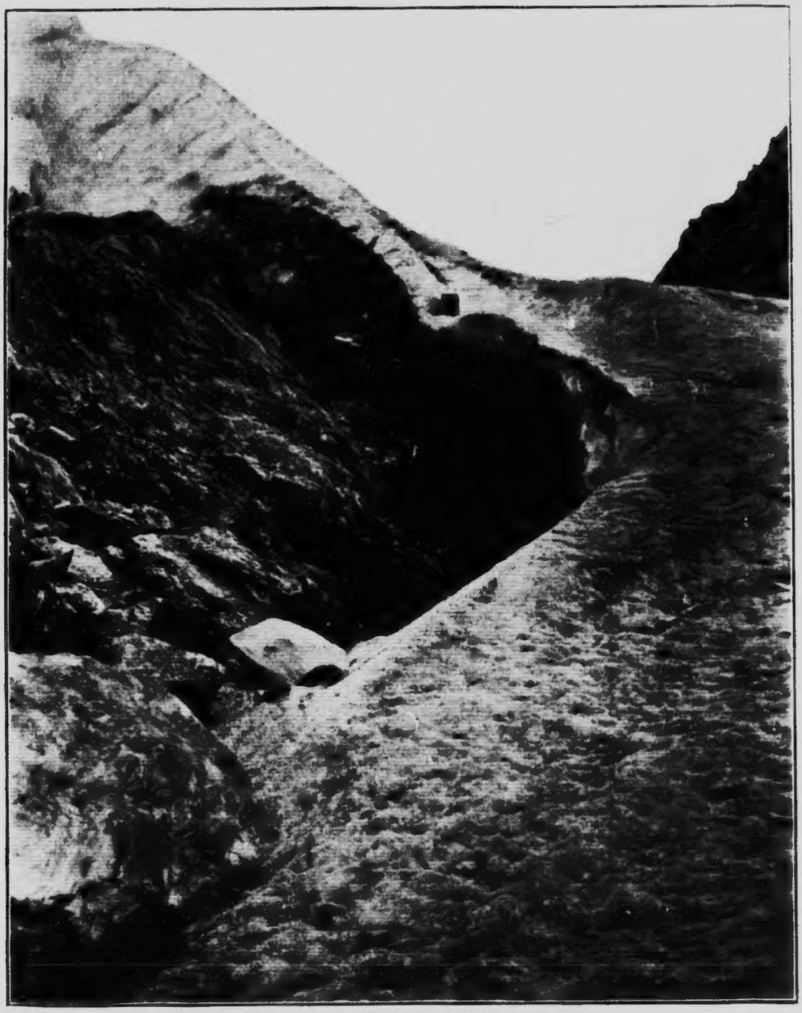
Since snow falls every month in the year on the névé fields and never melts away one might expect the mountains, especially the Selkirks, to grow as snowheaps into the sky; but of course this does not take place. Under the increasing load of snow the lower beds are compressed into ice; so that the névé, beginning as loose or hard drifted snow above passes downwards into ice banded with blue and white layers, the whole sometimes hundreds of feet in thickness.

The snow accumulates only on the gentler slopes or in the higher valleys. On cliffs it cannot lodge but piles up on the névé beneath; and on steep slopes it may lie for a time but now and then, especially toward spring, it breaks loose and thunders down into the valley as an avalanche.

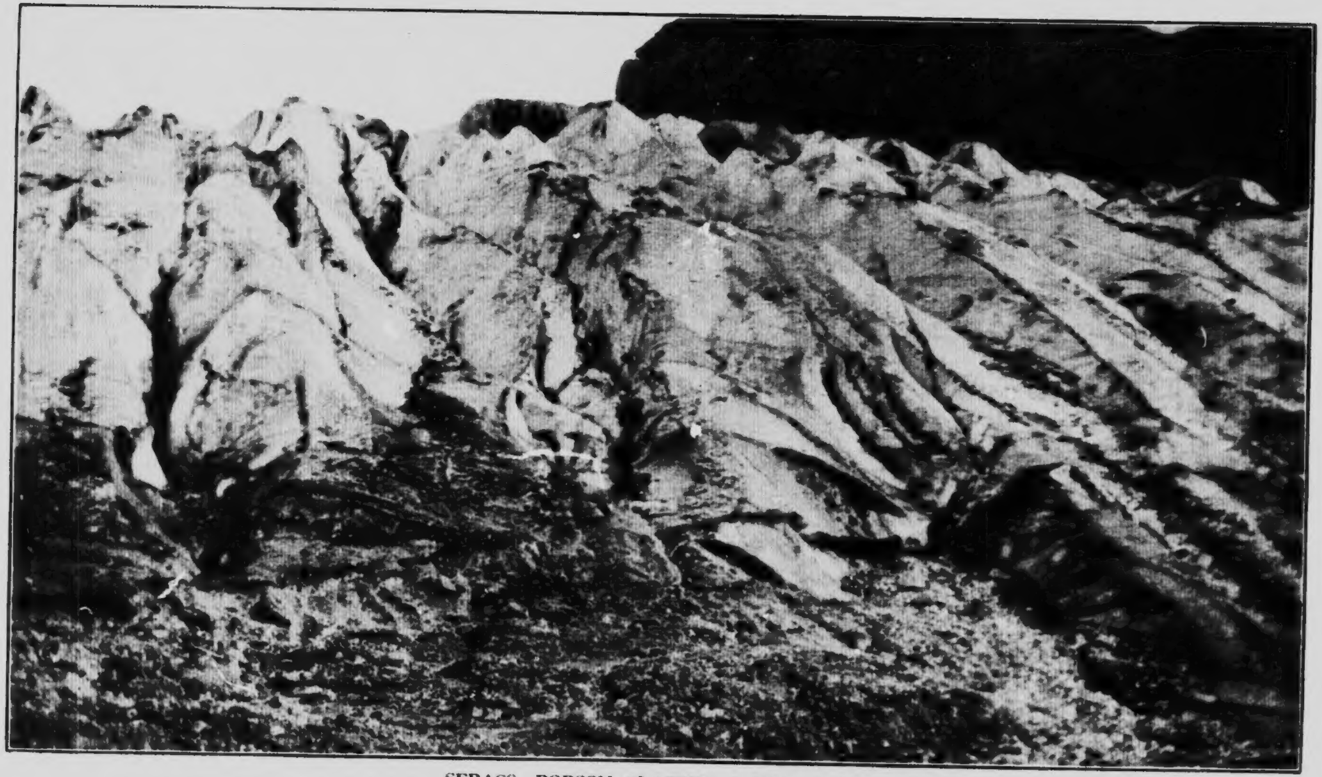
The Motion of Glaciers.

The final disposal of the snowfield, turned to ice in its lower parts, comes by a slow creep downwards. That the névé is actually in motion can be seen by following the slope of snow to its upper edge against some mountain wall where a "BERGSCHRUND" generally yawns between the snowfield and the cliff. This may be several feet wide and may go down many feet to obscure depths. No amount of snow fall can fill the chasm permanently, though it may be bridged with fresh snow for a time, making a risky passage for the climber.

The névé is always pulling away from the rocks at its upper border, and its general motion follows the direction of the lowest



CAVERN ON ILLECILLEWAET GLACIER

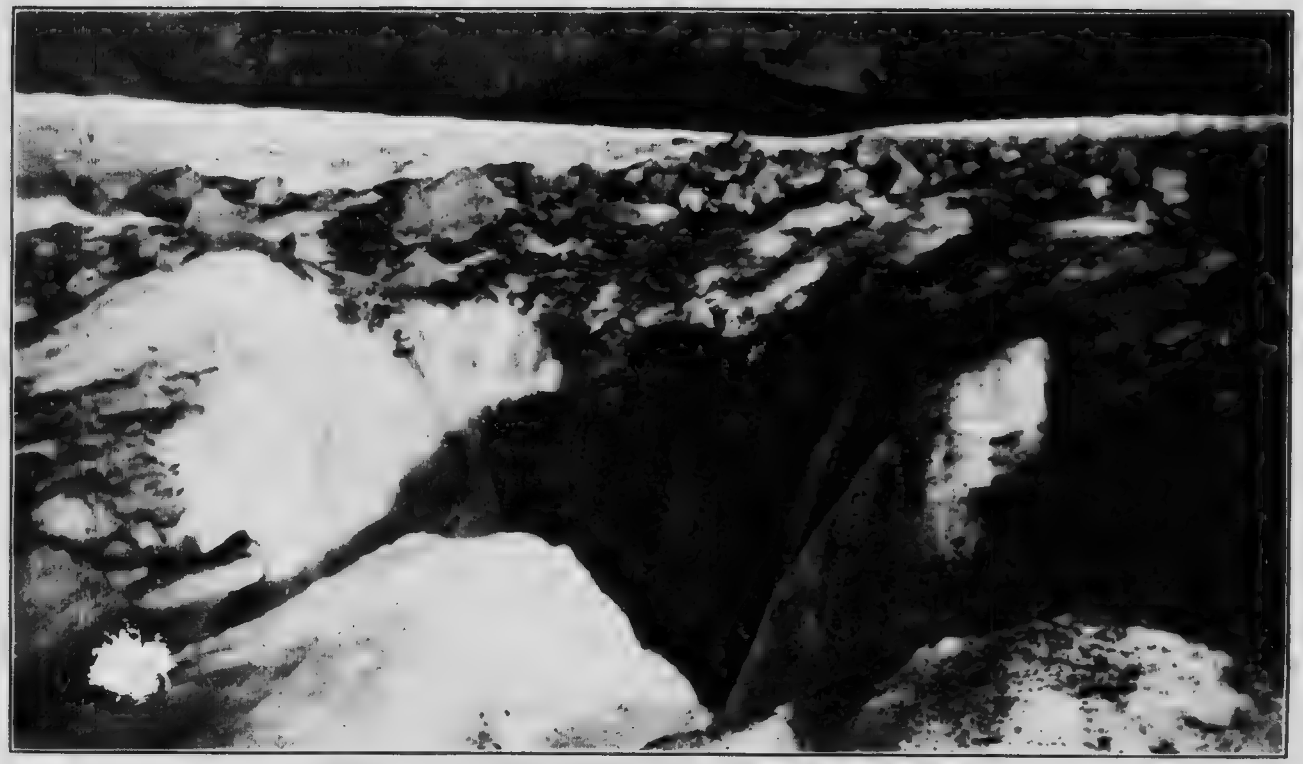


SERACS, ROBSON GLACIER, JASPER PARK

depression beneath, finally extending below snowline as a tongue of ice which reaches down into the valley until it is melted by the increasing warmth of the lower levels. Thus a glacier is born. Unless whitened by recent storms the glacier is bare of snow in summer with a rough uneven surface of a dirty blue green color, partly covered with rocky debris, and its volume diminishes downward by thawing until at a definite point the whole is melted and flows away as a river of water instead of ice. The lower end is sometimes called the "tongue" or "snout" or "foot" of the glacier—a bad case of mixed metaphors.

CREVASSE ON GREAT GLACIER

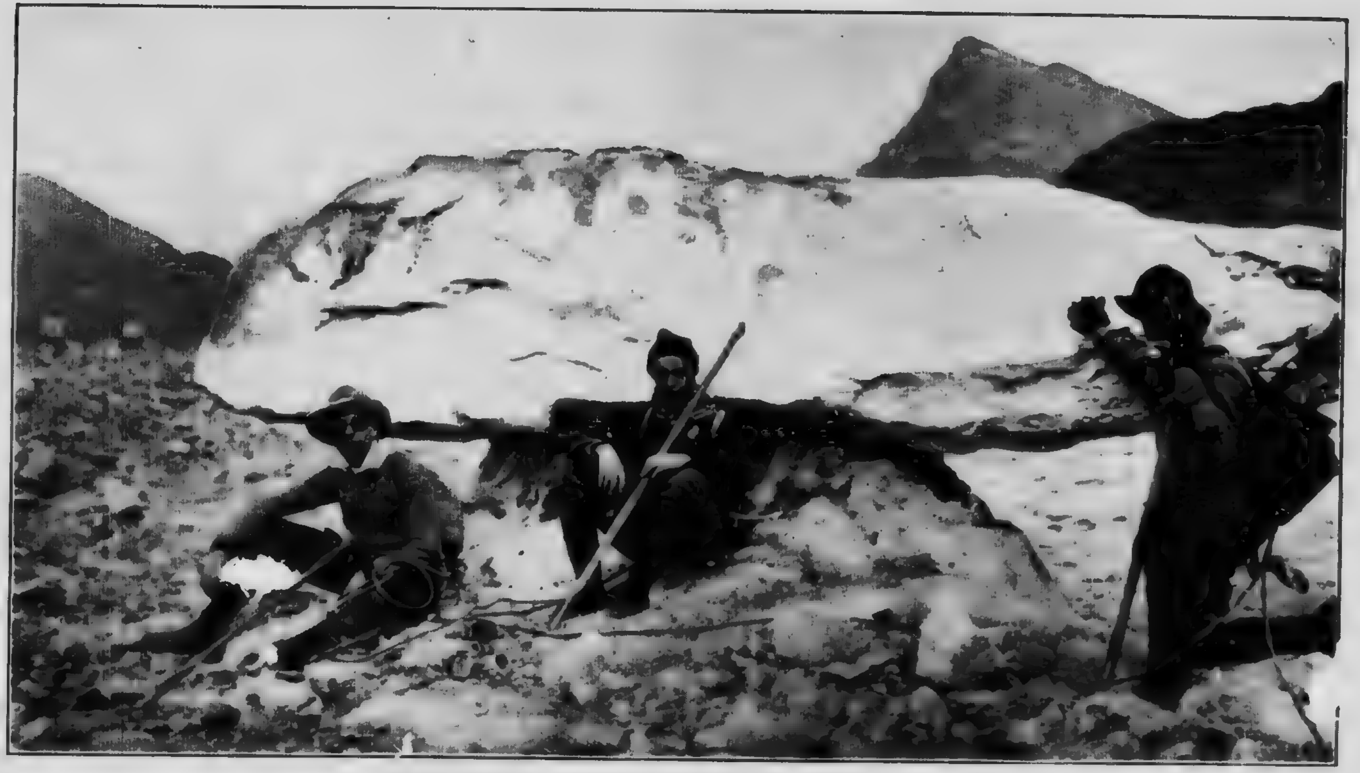
Remembering that ice is a hard and brittle solid, it comes as a surprise to find that it can flow like a plastic body under the pull of gravity; but this can be easily proved. A row of stakes or of metal plates put across a glacier gradually gets out of line, the middle parts moving fastest as in a river; but the motion is very slow, even in the middle, seldom more than



MOULIN (IN MORNING BEFORE THAW BEGINS) ROBSON GLACIER a few inches a day in our mountain glaciers, though some of the great Alaskan and Greenland glaciers are reported to move several feet a day and in one or two cases as much as 60 or 70 feet.

At a sudden descent, where a river would leap as a waterfall, a glacier simply breaks across in what are called "CREVASSES," fissures which may be several feet wide and hundreds of feet long, going down to blue black depths appalling to the inexperienced climber. As the glacier advances these crevasses are bent out of shape and may be crossed by fresh crevasses, splitting up the ice into wild lumps and pinnacles called "SERACS." Seen from a distance across some valley such an ice fall looks like a cascade or a violent rapid covered with breakers. Below these steep descents the crevasses and seracs disappear by the pressure of the moving ice and the glacier becomes a solid mass again. Small glaciers hanging from cliffs may send down avalanches of ice which combine to make a lower glacier, the masses being welded together once more.

MORAINE OF VICTORIA GLACIER



GLACIER TABLE, NEAR TEN PEAKS, ROCKY MOUNTAINS PARK

It is evident that one cause of glacier motion is the power which ice has to break and then to freeze together again.

Since glaciers are often the easiest way up a mountain, climbing parties make use of them, starting at dawn so as to have a long day and following up the rough and rigid slope, zigzagging round crevasses and avoiding regions of seracs. Toward the upper end there may be fresh snow bridging the crevasses and the party should be roped together and travel in single file, the leading guide thrusting his ice axe into the snow at every step to make sure of safe going. A fall into a crevasse when unroped may be fatal. Seventeen years ago while climbing Mt. Gordon north of lake Louise, Mr. C[illegible]hompson slipped 60 feet into a crevasse where he was wedged in between the narrowing walls. Dr. Collie was lowered to rescue him, and he was finally pulled out by a glacier rope fastened round his arm, but it was a narrow escape.

LAKE AGNES, A GOOD EXAMPLE OF A CIRQUE LAKE

When the sun shines warmly on the glacier melting begins and water trickles down the ice ridges, and towards afternoon torrents of pale blue water are racing downwards in ice channels, here and there plunging into a crevasse. This becomes hollowed into a tube like the penstock of a water power and the foamy torrent springing into the blue chasm is called a "moulin," or mill. In this way the waters thawed from the surface reach he bottom and there roar along through an ice tunnel to the end of the glacier, bursting into daylight as a full fledged river.

Glacial streams are capricious. On a frosty morning scarcely any water flows and one can go far into the ice cave, but in the late afternoon there is a raging torrent loaded with mud and stones spreading into half a dozen channels on the broad flood ground. On a rainy or snowy day when the sun is hidden the glacial river almost goes out of business, but comes to life again when the clouds vanish and the sun shines. At those heights with a clear sky the heat of the sun may be intense though it is freezing a few feet away where some rock casts a shadow.

The Work of Glaciers.

One of the most interesting points in a glacier is its carrying power. Though it is in motion like a plastic substance it is solid and strong enough to support any weight loaded upon it. Debris quarried by frost from the mountain side buries its edge so that often one may walk 50 yards out before the ice can be seen. This fringe of broken rock carried on the edge of the glacier is called a marginal moraine. When two glaciers join, the marginal moraines between them unite to form a medial moraine, and when several tributaries combine to make a large glacier the dark lines of the medial moraines can be followed by the eye for long distances upwards to rocky peaks rising out of the névé, the source from which the train of rocks was derived.

Blocks even as large as cottages now and then roll down upon the ice and are transported without trouble. Medium sized blocks a few feet across called "glacier tables" are left standing on pedestals of ice, as thawing goes on all round them, since they protect the ice beneath from the sun.

The whole mass of stony material is carried steadily onwards until the end is reached where melting is complete and no more burdens can be borne. Then a terminal moraine is piled up, a steep and rugged crescent of loose blocks by no means easy to scramble over.

Work just as important is going on out of sight beneath the glacier, where fragments of stone frozen into the bottom of the ice form tools for gouging, carving and scouring the rocky floor, both tools and rock being ground up into the "rock flour" that makes the glacier streams so milky and opaque. The ground up material mixed with stones of all shapes and sizes without any assortment is left behind when the glacial thaws as "boulder clay." A little search in this clay shows stones with polished and striated surfaces, well worn tools, often called "soled boulders" and the rock surface beneath the boulder clay is seen to be rounded, smoothed and grooved in a very striking way.

The Retreat of Glaciers.

Our glaciers, like those of other countries, are now almost all in retreat, either because the climate is slowly growing warmer so that thawing goes on faster or because the snowfall is lessening so that the névé fields no longer feed the glaciers as substantially as before. On this account one can often see several terminal moraines down the valley below the one now forming. The nearest to the present end of the ice is almost bare, the next, a few hundred yards away, may have bushes growing on it, and others a mile or two away may be covered with ancient forest.

For some years past the Vaux family of Philadelphia, two brothers and a sister, all admirable photographers, have fixed the position of the end of all accessible glaciers by marking points and directions on rocks near by and by photographing the snout of the glacier. This work determines their rate of advance or recession from year to year, and a record of the

LAKE LOUISE AND VICTORIA GLACIER

results is published in the journal of the Alpine Club of Canada and elsewhere.

Glaciers once filled all the mountain valleys and even pushed out through the passes into the prairies and through the fiords to the sea, for everywhere one finds boulder clay and moraines and valleys with U shaped cross sections that can only be accounted for by glacial action on a large scale. This work was done during the Ice Age, and one may truly say that the higher mountains are still in the Glacial Period.

One of the most beautiful results of former ice action is to be found in the "cirques," half Kettle or arm chair valleys, high up among the mountains overhanging the main valleys and enclosed by [illegible] cliffs on all sides except in front. These are the deserted nests of cliff glaciers, hollowed out by the ice itself and often deepened so that a turquoise blue lake lies within rock[illegible]. If not too high up these cirque lakes are surrounded by [illegible]green forest, behind which rise the gray or purple walls of rock with some snow in the ravines above, the whole mirrored in the lake, until some catspaw of breeze shatters the reflection. Lake Agnes in the mountains behind lake Louise is an easily reached example of a cirque basin, and there are hundreds of others scattered through the fastnesses of the mountains, all gems in their way, many not yet seen by the eye of a [illegible] man. The higher cirque lakes, above timberline, enclosed [illegible] cliffs and snow, have an austere beauty of their own, [illegible] the graces and the wild flowers of their sisters below [illegible] forest zone.

Often the walls of [illegible] valleys are leaped by streams from some melting sno[illegible]ng hundreds of feet and reaching the bottom as m[illegible] of spray.

Glaciers Reached by the Canadian Pacific.

There are very few parts of the world where fine glacial scenery can be found so close to a great railway as in our mountain parks. If one stops at lake Louise, in Rocky Mountains Park, the splendid Victoria glacier is in view doubled by reflection in its waters, which get their exquisite color from the last remaining particles of mud brought down by the glacial stream. Two miles walk or ride along a good trail brings one into its presence, and often great masses of ice may be seen avalanching down from cliff glaciers above to the surface of the lower glacier. From lake Louise as a centre one can reach the well named Paradise valley by ten miles ride or drive over a good road and visit the fine Horseshoe glacier at its head. The valley of the Ten Peaks farther to the southeast requires a somewhat longer ride or drive, passing the splendid front of Mt. Temple, the highest summit in sight from the railway (11,626 feet). Moraine lake, eleven miles from lake Louise lies near the entrance of the valley but farther up can be seen the great Wenkchemna glacier, and several small glaciers lying between the Ten Peaks. Beyond the Ten Peaks to the south there is a broad snowfield and glacier leading over to Prospector's valley and Vermilion pass, but for an excursion of such length and difficulty one should be equipped for serious climbing and have a light camp outfit.

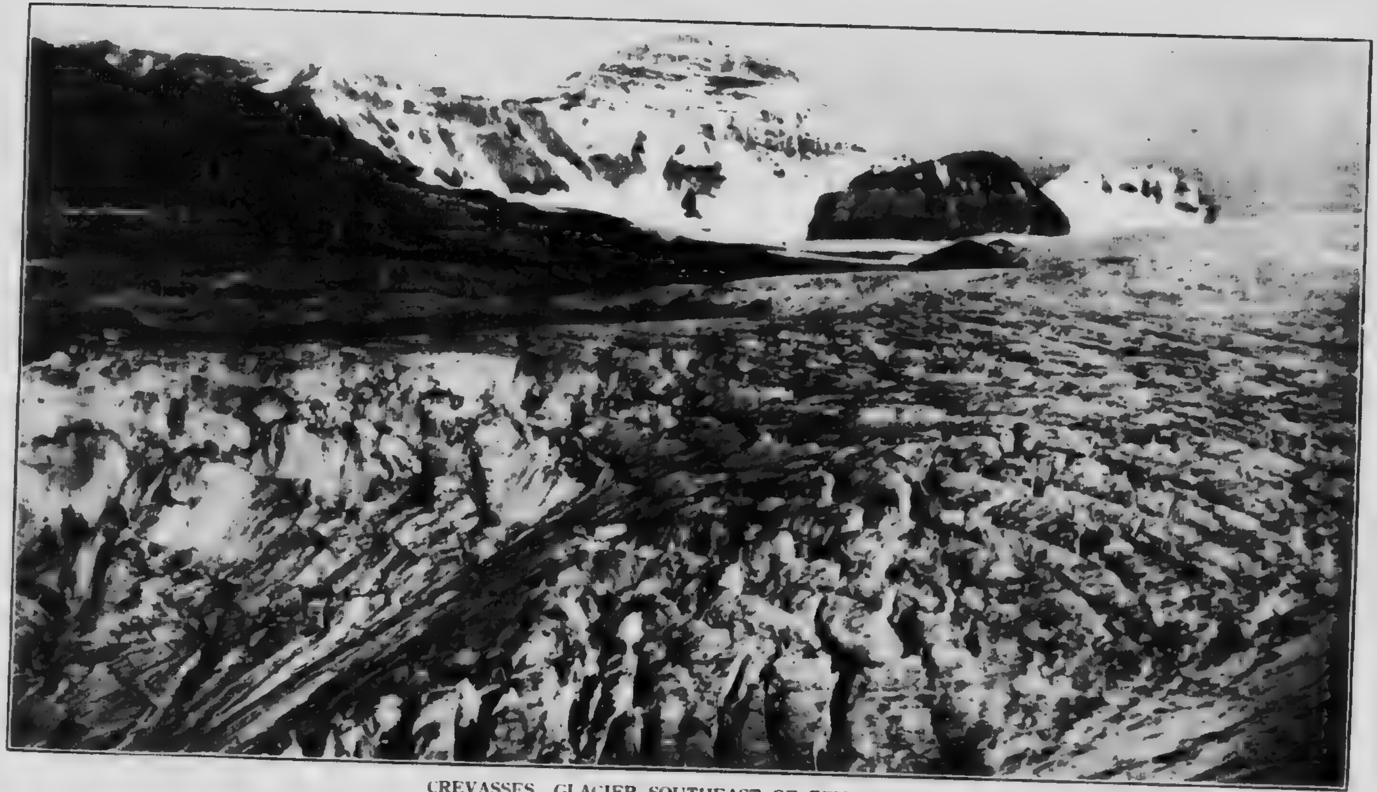
From any high point west of lake Louise one can catch glimpses of a much larger snowfield towards the north near Mts. Daly and Balfour, but the glaciers flowing from it are not so easily reached as those to the south of the railway.

There are glaciers in sight during most of the descent by rail from the summit of the pass through the wild Kicking-horse valley to Field, in the Yoho Park, from which the Yoho valley may be visited with Yoho glacier at its head. Descending beyond this into the warm depths of the Columbia valley the alpine type of scenery is lost for a time. As the railway climbs laboriously westwards out of the valley into the Selkirks, Glacier Park is entered. Here the scenery grows more striking until at Rogers pass one is once more surrounded by snow peaks hidden, alas! too often by the long snowshed. The five mile tunnel now being pierced to avoid the heavy grades of the pass will cut out many a ravishing view of snow peak and ice tongue; but a stay at Glacier, just beyond the pass, gives an unrivalled chance to study a fine glacier with the least possible trouble.

The Illecillewaet or Great glacier is only a mile and a half from Glacier station and as its foot may be reached with very little climbing, more travellers visit it than any other glacier in Canada. A climb to Mt. Lookout just west of the glacier gives a magnificent view over the Illecillewaet glacier and névé and over the grand mountains surrounding it. This region was the first part of our snowy mountains to be carefully explored and mapped by a skilful climber. The Rev. W. Spotswood Green made Glacier his headquarters for this work in 1888 and published his interesting book "Among the Selkirk Glaciers" in 1890.

THE ILLECILLEWAET OR GREAT GLACIER, GLACIER PARK

There are still finer snowfields and glaciers in the little explored region to the north around Mt. Sir Sandford, the highest point in the range (11,634 feet), though these are out of reach for the present; but any of the higher peaks near Glacier give a marvellous view over a wilderness of snow and ice broken by cliffs too steep for snow to lie.



CREVASSES, GLACIER SOUTHEAST OF TEN PEAKS

Some of the lower points of the Selkirks, just west of the Columbia valley, though not more than 7,000 or 8,000 feet in height, face the opposite Rocky mountains with 100 or more glaciers in sight at once, the view beyond the wide and deep valley sweeping 150 miles of the main chain on its snowy western side. Unfortunately up to the present no path has been made to such a lookout point, and the dense forest makes the ascent difficult.

The greatest névé in Canada, so far as known, is the Columbia snowfield covering 100 square miles and sending tongues of ice down into a dozen valleys, but this is 80 miles northwest of Lake Louise and can only be visited with a camp outfit and packtrain. Its northern limit will be within the new boundaries of Jasper Park and some day a good road will lead through the mountains past this splendid glacier region from the Grand Trunk Pacific to the Canadian Pacific opening up to the public the finest glacial playground in Canada.

The Robson Region.

The beauties of the Louise, Field and Glacier regions on the Canadian Pacific are well known to the public and have been seen by thousands but the exceedingly impressive glacial surroundings of Mt. Robson near the Yellowhead Pass on the Grand Trunk Pacific have so far been little visited. Mt. Robson, rising 13,087 feet above the sea, the highest point in the Canadian Rockies, is invisible from the pass itself, hidden by the nearer Rainbow mountains but bursts upon the view where Grand Forks river enters the Fraser. Only a few miles away at the head of the low valley its tremendous cliffs, mostly too steep for snow to lie, rise for 10,000 feet, crowned with a snowy pyramid. A trail leads up the Grand Forks through the valley of a Thousand Falls where the main river tumbles 1,500 feet in a wild canyon and reaches the rear side of Mount Robson 5,700 feet above the sea. From some low mountains to the northwest there is perhaps the most splendid view in North America of mountains, glaciers and lakes. The blue seracs of the Tumbling glacier seem to be rushing down

CREVASSE, ROBSON GLACIER

thousands of feet from the Helmet and the main peak of Robson to plunge into Berg lake, which doubles them by reflection. To the left the main glacier, starting in great icefalls on the northeast of the peak, sweeps a curve of five or six miles round the dark rocks of the Rearguard. Behind the main glacier toward the south rises the unbroken snow slope of Mt. Resplendent ending with a projecting cornice of snow at 11,000 feet.

The water coming from the ice caves of the main glacier flows chiefly into Berg lake and the Grand Forks, but a smaller part reaches lake Adolphus and Smoky river, a tributary of the Mackenzie river, the same glacier sending tribute to the Arctic and the Pacific Oceans.

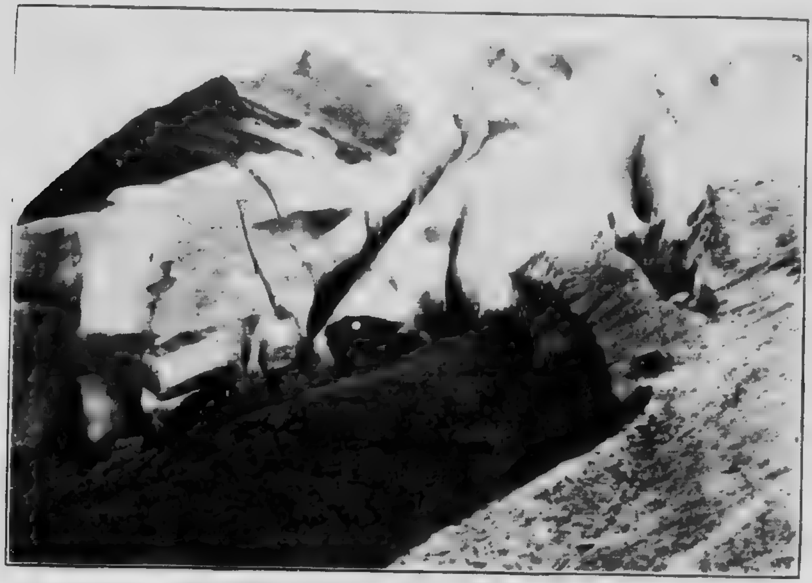
There are other striking mountains in the region, such as Mt. Geikie to the south of the Yellowhead pass and the Whitehorn to the north, though none rival Mt. Robson itself; but much remains for exploration and it will be years before this northern region of the Rockies, all the Alberta side of which is in Jasper Park, is thoroughly known and mapped. Trails are being rapidly built in the park, however, and with the erection of hotels at Jasper and other points it will soon be possible for the alpine climber and the tourist to find easy access to this delightful region.

Some Comparisons.

Much of the exploration of the Canadian Rockies and Selkirks has been done by Englishmen and eastern Americans who received their training as mountaineers in the Alps, and one naturally asks why they should travel thousands of miles to our western mountains when the Alps are so much more accessible. There is, of course, the charm of a virgin and unexplored wilderness in our Rockies and Selkirks, so seductive to one who loves adventure; but there are other attractions as well which make our mountains fully the equal of the famous European range. Every type of Alpine scenery is as well illustrated in Canada as in Switzerland and the area of snow mountains in Alberta and British Columbia is several times that of the Alps. The whole length of the Alps is less than

GLACIAL STREAM, MT. ROBSON, DIVIDES WATERS BETWEEN THE PACIFIC AND ARCTIC OCEANS

400 miles and its breadth from 50 to 80; as compared with a length of 1200 miles and a breadth of 140 miles for the Rockies and Selkirks, not to mention the Gold ranges, the Coast range and the Vancouver Island mountains, all of which have their snow fields and glaciers. Stuttfield and Collie in their delightful book "Climbs and Explorations in the Canadian Rockies" say of the Rockies that "they have a remarkable individuality and character in addition to special beauties of their own which Switzerland cannot rival."



ICE BRIDGE ON ILLECILLEWAET GLACIER

Though there are higher mountains in the Rockies of the United States, they rise from a dry and lofty tableland and most of them have little snow and no glaciers. But for the row of extinct volcanoes beginning with Mt. Baker, Mt. Ranier and Mt. Shasta, the United States has very little truly alpine scenery except where our Rocky mountain ranges extend for a degree or two south of the boundary. A great many of the mountain climbers of the eastern states come to Alberta or British Columbia when they want to use an ice axe or a glacier rope and most of their experienced climbers are members of the Alpine Club of Canada.

Canadians themselves are often not aware of the splendid scenery and the unsurpassed opportunities for climbing of all grades of difficulty offered by their own mountains. There is no more exhilarating sport than that of the mountaineer, and there is no more interesting region for the geologist, the botanist or the zoologist than the grand ranges of mountains that run parallel to the Pacific in our western territory. While tourists from all over the world are being attracted more and more to our glorious alpine region it is especially important that our own people should seek a delightful holiday and gain health and vigor in our mountain parks. As good roads and trails and cabins for shelter are extended to the wilder and more impressive parts of the mountains it becomes easier for the ordinary visitor to study the sublimities of valleys, glaciers and mountain peaks once out of reach without an expensive camp equipment.

A few good Swiss guides are available at the more important centres in the mountains and the inexperienced climber should not undertake any difficult glacier work nor bad rock climbing without the aid of a guide. There is of course a wide range of less difficult walks and climbs that brings one without risk into the heart of the mountains where one may study the ways by which snowfields and glaciers and glacial rivers do their work of shaping the mountains.

A. P. Coleman in "The Canadian Rockies"

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IF ONE halts by chance anywhere on a mountain pass, all sorts of thrilling things are going on around. Lovely flowers are opening eagerly to the sun and wind of Spring—in mid August, with September snows just at hand, a whole year's work of blossom and seed to be accomplished before the ten months' winter Sleep begins. Bees are tumbling over them intoxicated with honey and the joy of life while it is summer. Even the humming-birds, with jewels on their breasts as if straight from the tropics, are not afraid to skim up the mountain sides, poise over a bunch of white heather, and pass with a flash from flower to flower. The marmots with aldermanic vests are whistling and "making hay while the sun shines," and one may see their bundles of choice herbs spread on a flat stone to dry, while the little striped gophers are busy too. Time enough to rest in the winter.

Everything full of bustle and haste and of joy, what could be more inspiring than the flowery meadows above tree-line when the warm sun shines in the six weeks of summer! The full splendour and ecstacy of a whole year's life piled into six weeks after the snow has thawed and before it falls again!

Higher up even the snow itself is alive with the red snow plant and the black glacier flea, like the rest of the world making the most of summer; and as you take your way across the snow to the mountain top, what a wonderful world opens out! How strangely the world has been built, bed after bed of limestone or slate or quartzite, pale grey or pale green or dark red or purple, built into cathedrals or castles, or crumpled like colored cloths from the rag-bag, squeezed together into arches and troughs, into V's and S's and M's ten miles long and two miles high; or else sheets of rock twenty thousand feet thick have been sliced into blocks and tilted up to play leap-frog with one another.

And then the sculpturing that is going on! One is right in the midst of the workshop bustle where mountains are being carved into pinnacles, magnificent cathedral doors that never open, towers that never had a keeper—all being shaped before one's eyes out of the mighty beds and blocks of limestone and quartzite that were once the sea bottom. You can watch the tools at work, the chisel and gouge, the file and the sandpaper. All the workmen are hard at it this spring morning in August; the quarryman Frost has been busy over night, as you hear from the thunder of big blocks quarried from the cliffs across the valley; there is a dazzling gleam on the moist, polished rock which craftsman Glacier has just handed over to the daylight; and you can watch how recklessly the waterfall is cutting its way down, slicing the great banks of rock with canyons!

It is inspiring to visit the mountains any day in the year, but especially so in the July or August springtime when a fresh start is made, and plants, animals, patient glaciers, hustling torrents, roaring rivers, shining lakes are all hard at work rough hewing or putting finishing touches on an ever new world.

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"From the physical geographer's point of view, every feature of the Alps has its counterpart somewhere in the Rockies; folds and faults and tilted strata are carved into an infinitude of shapes, including risky peaks and aiguilles; snow and ice are present in every form, smooth and easy or torn with blue crevasses and splintered into daring seracs. There is every variety of stream at work, clear or muddy, gentle or furious, including much larger rivers in much longer valleys than any in the Alps. Small lakes are far more numerous and beautiful. Every element of interest and beauty on the physical side is as well developed somewhere in the Rockies as it is in the Alps; but from my own observation I may suggest that often the Alpine mountain group is better posed, the picture better composed from the point of view of the beholder, than in the Rockies. The reason for this is I believe, largely one of area. The comparatively small mass of the Alps is more statuesque and more easily seen from the proper point of view than any part of the Cordilleran region, which sprawls over a hundred thousand square miles. This seeming lack of focus and concentration at dramatic points seems to me the greatest defect of the Rockies as compared with the Alps.

On the other hand, there is a cleanness and virginity, an exquisite loneliness, about many of the Rocky Mountain peaks and valleys that has a peculiar charm. There is the feeling of having made a new discovery, of having caught Nature unawares at her work of creation, as one turns off from a scarcely-beaten route into one never trodden at all by the feet of white men; and this experience may be had in a thousand valleys among the Rockies."